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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,280	01/22/2004	James David Clark	00169.100676.	3176

5514 7590 08/11/2009

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EXAMINER	
SHIKHMAN, MAX	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
08/11/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/761,280	CLARK, JAMES DAVID	
	Examiner	Art Unit	
	MAX SHIKHMAN	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

1. Applicants' RCE response to the last Office Action, filed 05/26/2009 has been entered and made of record.

Response to Arguments

2. Applicant argues: Lee, "terminate" indicates the completing of the coding pass or code block. This can be seen in section D.4.1, as well as from section D.6 on page 101, which states that, after each magnitude refinement pass the bitstream has been "terminated" by padding to the byte boundary.

Reply: p99, "arithmetic coder shall be terminated either at the end of every coding pass or only at the end of every code-block." The left-over may not be coded and is thus inactive.

Applicant argues: page 99, that "COD or COC marker signals which termination pattern is used .... " Accordingly, the Office Action appears to contradict itself in that it offers an inconsistent interpretation of "terminate" as used in Lee.

Reply: Where is the contradiction? p99 "COD or COC marker signals which termination pattern is used". COD and COC are attributes.

Applicant argues: p17 terminate flag is not used in Table D.9 or D.8 to decide if the information is to be encoded or not. Table D.8 shows examples of arithmetic coder termination patterns. As mentioned above, termination details how the coding pass or code block is terminated. At no point is the information "discarded".

Reply: p99, "arithmetic coder shall be terminated either at the end of every coding pass or only at the end of every code-block." Once arithmetic coder is terminated, the rest of info is not encoded. The info that was not encoded is effectively discarded from the bitstream.

Applicant argues: p17 Instead, in Lee, all of the passes in Table D.8 are encoded.

Reply: All passes can be *optionally* encoded. p100 section D.4.2, "According to the termination style selected, a certain number of coding passes are performed before the arithmetic coder is terminated. The truncated length of the bit stream segment..." Meaning, not everything is coded. Whatever is not coded, specified in advance by the COD/COC, is inactive.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2,4-18 rejected under 35 U.S.C. 103(a) as being unpatentable over LEE, "TITLE: JPEG 2000 Part I Final Committee Draft Version 1.0" in view of Andrew (PGPUB 20020131084).

() **Regarding Claims 1,10,12,13,18:**

{LEE: attribute=P101 value specifying COC, COD.
scans=cleanup, significant prop, magnitude refinement.

attribute being separate=P101 Table D-9, AC or raw separately assigned to each scan.
active = P101 Table D-9, AC, raw. *inactive*=terminate.

discrete cosine transformation=Haar wavelet transform.
"*active*", "*inactive*" not defined in claim.

DC most-significant scans=P93 Table D-1. "0".

}

1. (Currently Amended) A method of compressing image data into a fixed size memory, the image data being encoded using a discrete cosine transformation [Haar wavelet is 2x2 DCT. "Haar transform (two channel DCT)" Wavelet Transforms in a JPEG-Like Image Coder. Ricardo de Queiroz]

and arranged into a plurality of scans of bitstream data, (Lee. P93 D.1 "scan") the plurality of scans being ordered from a perceptually most significant scan (Lee. P99 Table D8, "Significance Propagation") to a perceptually least significant scan, (Lee. Table D8, "cleanup")

the method comprising the steps of:

determining whether the scans are a DC most significant scan or not;

(P93 Table D-1. "0".)

determining whether the scans are *active* (Lee. Table D8: "AC") or *inactive*; (Table D8: "AC, terminate") based on an attribute (P99, "COD or COC marker signals which termination pattern is used" P 100,101 COC, COD.) associated with each of the scans, the attribute being separate (P101 Table D-9, "AC","raw","terminate" separately assigned to

each scan.) from the scan and identifying whether the scan is either *active* (AC) or *inactive;*

(terminate.)

encoding (Lee. Table D9: "Arithmetic Coding") the determined *active* scans of bitstream data and discarding the determined *inactive* scans; (Lee. Table D8: "terminate")

without encoding the *inactive* scans; …wherein the *inactive* scans are not encoded.

(LEE. P100, "Arithmetic encoder termination". p101 "Table D-9 — Selective arithmetic coding bypass". P171 "arithmetic coding bypass style puts raw bits into the bit stream without arithmetic coding."

Applicant's [456,458] = Andrew's [356,358] "*Discard Entropy Encoded data*".

Encoded *inactive* data is discarded.)

Lee discloses everything as described above except, transferring the encoded scan bitstream data to the fixed size memory; and setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the *active* scans to *inactive*.

Andrew discloses as follows,

determining whether the scans are a DC most significant scan or not; (Fig7 DC band)

transferring the encoded (106) scan bitstream data to the fixed size memory; (110)

([0037] "106 for entropy encoding the transform coefficients produced by the DCT unit 104, a scan output manager 108 for managing the storing of the transform coefficients in the final output buffer 110 of fixed memory size.")

and setting, if the fixed size memory becomes full, the attribute (flag) of a currently least significant scan (insignificant) of the *active* scans to *inactive*.

([0066] "...if the scan output manager 108 determines 350 that the free block register 212 is zero the scan output manager 108 sets 352 the *active* flag entry in the memory management table 200 of the most perceptually insignificant of the *active* scan streams to *inactive*.")

As Andrew discloses, if the memory is full, it is desirable to set the most perceptually insignificant of the *active* scan streams to *inactive*. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Andrew's method, set "*the active flag entry in the memory management table 200 of the most perceptually insignificant of the active scan streams to inactive*" in Lee's method to efficiently manage limited memory resources.

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

() **Regarding Claim 2:**

(Currently Amended) A method according to claim 1, wherein the method further comprises the step of: deleting, (overwritten) if the fixed size memory becomes full, the encoded scan bit-stream data of the currently least significant scan. (Andrew's [0015]. "if it is

determined the storage is full a coded least perceptually significant partition currently stored in said buffer is overwritten by data from a coded more perceptually significant partition." 358.)

() **Regarding Claim 4:**

4. (Currently Amended) A method according to claim 1, wherein said encoding step further comprises the step of:

entropy encoding (P71. Lee. Table D8: "arithmetic coder") the current scan of bitstream data, if the attribute (P31 Table A-17, "xxxx x0xx" or "xxxx x1xx")

of the current scan is *active*; (P99 Table D8: "AC".) otherwise: (Table D8: "AC, terminate") proceeding to a next scan of bitstream data.

() **Regarding Claim 5:**

5. (Currently Amended) A method as claimed in claim 1, wherein the encoding step further comprises the step of:

accessing a scan of bitstream data for encoding in accordance with a scan map. (P99 Table D8.)

() **Regarding Claim 6**:

A method as claimed in claim 1, wherein the image data comprises a plurality of quantizing 8x8 blocks of DCT transformed image data,

([0040] "The resultant transformed data is preferably quantized according to the JPEG standard."

[0031] "FIG. 7 shows a Table indicating the partitioning of the 8.times.8 DCT blocks of transform coefficients.")

and wherein the scans comprise at least for each color component of the quantized DCT transformed image data,

([0043] "AC coefficients (coefficients 1-63) for the Y component (component 0). Similarly, Scan 3 comprises the same for the Cr component (component 1). Similarly, Scan 4 comprises the same for the Cb component (component 2).")

two scans for the two least insignificant bitplanes of the group of AC coefficients 1 to 32, and two scans for the two least insignificant bitplanes of the group of AC coefficients 33 to 63.

([0047] "For the remaining scans, each bit plane is separated into three scans … one for coefficients 1 to 5 and one for the remaining AC coefficients (coefficients 6-63)." Andrew does not disclose AC coefficients 1 to 32 and 33 to 63.)

Andrew does not disclose expressly scanning AC coefficients 1 to 32 and 33 to 63. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to scan AC coefficients 1 to 32 and 33 to 63. Applicant has not disclosed that scanning AC coefficients 1 to 32 and 33 to 63 provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the spacing taught by Andrew or the claimed scan AC coefficients 1 to 32 and 33 to 63, because both scans perform the same function of implementing successive approximation mode in JPEG.

Therefore, it would have been obvious to one of ordinary skill in this art to modify

Andrew, scan AC coefficients 1 to 32 and 33 to 63 to obtain the invention as specified in claim 6.

() **Regarding Claim 7**:

{Note: DC most-significant scans=P99 Table D-8. # = 1)}

7. (Currently Amended) A method according to claim 1 wherein the scans comprise DC most-significant scans, (P99 Table D-8. # = 1) DC refinement scans, (# = 2) AC most-significant scans, (#=3) and AC refinement scans. (# = 4) (P99 Table D-8. "# Pass")

() **Regarding Claim 8**:

8. (Currently Amended) A method according to claim 7: wherein one of the DC most-significant scans is the perceptually most significant scan (P99 Table D-8. #=1) and one of the AC refinement scans is the perceptually least significant Scan. (# = 4)

() **Regarding Claim 9**:

9.(Currently Amended) A method according to claim 2, wherein the image data comprises a plurality of color components ([0038] "color raster image data 102") and said deleting step deletes includes deleting corresponding encoded scan bit-stream data of more than one color component. (102)

() **Regarding Independent Claims 11, 14**:

11. (Currently Amended) A method of storing coded image data of an image in a storage of fixed memory size, wherein the image comprises a plurality of pixels and the method comprises the steps of:

arranging the image into a plurality of bands each comprising a predetermined number N of consecutive lines of pixels;

(Andrew's [0015], "arranging the image into a plurality of bands each comprising a predetermined number N of consecutive lines of pixels;")

buffering and processing the bands one by one in turn, wherein said processing step comprises the following sub-steps for each currently buffered **band**:

(Andrew's [0015], "**buffering** and processing said bands one by one in turn, wherein the processing step comprises the following sub-steps for each currently buffered said **band**:")

arranging the current band into a plurality of blocks of pixels of size MxM, wherein M is equal to the predetermined number N; and

(Andrew's [0015]," arranging the current band into a plurality of blocks of pixels of size MxM, wherein M is equal to said predetermined number N;")

transforming the blocks of pixels using a discrete cosine transformation (104) to produce respective blocks of transform coefficients; (Andrew's [0015]," transforming said blocks of pixels to produce respective blocks of transform coefficients;")

partitioning the blocks of transform coefficients into a plurality of partitions wherein each partition comprises data from each block of transform coefficients and at least one partition comprises data from at least one but not all bit-planes of each block of transform coefficients, and wherein the plurality of partitions comprise a perceptually significant partition and a perceptually insignificant partition and partitions of varying perceptual significance **therebetween**,

(Andrew's [0015], "**partitioning** the blocks of transform coefficients into a plurality of partitions wherein each partition comprises data from each said block of transform coefficients and at least one partition comprises data from at least one but not all bit-planes of each said block of transform coefficients, and wherein the plurality of partitions comprise a perceptually significant partition and a perceptually insignificant partition and partitions of varying perceptually significance **therebetween**;")

and wherein the partitions have associated therewith an attribute (Fig 2: flag 210) determining whether the partition is *active* or *inactive*; (210) wherein the *active* (210) partition is to be encoded (106)

entropy coding if the partitions are a perceptually significant partition, ([0015] coding each said partition;) each *active* partition (106) of the blocks of transformed coefficients (104) while discarding the *inactive* partitions…

([0067] If the entropy encoded stream that just became *inactive* is the current scan stream, the fragment of entropy encoded data is discarded 358…

Applicant's [456,458] = Andrew's [356,358] "*Discard Entropy Encoded data*". Encoded *inactive* data is discarded.)

storing the entropy (106) coded partitions in the storage of fixed memory size, wherein, during the storing of the entropy coded partitions, if it is determined that the storage is full a coded least perceptually significant partition currently stored in the storage is overwritten by data from a coded more perceptually significant **partition**

(Andrew's [0015], "**managing** the storing of the said coded partitions in the storage of fixed memory size, wherein during the storing of said coded partitions if it is determined the storage is full a coded least perceptually significant partition currently stored in said buffer is overwritten by data from a coded more perceptually significant **partition**.")

and the attribute of the overwritten perceptually least significant partition is set to *inactive*.

(Andrew's [0066] "if the scan output manager 108 determines 350 that the free block register 212 is zero the scan output manager 108 sets 352 the *active* flag entry in the memory management table 200 of the most perceptually insignificant of the *active* scan streams to *inactive*.)

Andrew discloses everything as described above except, …without encoding the *inactive* partitions, …and the *inactive* partition is not to be encoded;

LEE discloses, *without encoding the inactive partitions.*

LEE. P100, "Arithmetic encoder termination". p101 "Table D-9 — Selective arithmetic coding bypass". P171 "arithmetic coding bypass style puts raw bits into the bit stream without arithmetic coding."

As LEE discloses, it is desirable to bypass the encoder to minimize the amount of data coded. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use LEE's method in Andrew, delete *inactive* partitions without encoding.

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

() **Regarding Claims 15, 16, 17:**

15. (Currently Amended) A computer program product comprising computer readable program code recorded on a machine-readable recording medium, for controlling the operation of a data processing apparatus on which the program code executes to perform a method of …

(Andrew. [0021] - [0023])

The rest of limitations of Claims 15, 16 are disclosed in Claim 1.

The rest of limitations of Claim 17 are disclosed in Claim 11.

5. Claims **1,2,10-18** rejected under 35 U.S.C. 103(a) as being unpatentable over Vleuten US-PAT-NO: 6462681, "Scalable coding by scanning selected parts of respective bit-streams" in view of

Andrew 20020131084.

() **Regarding Claims 1,10-18:**

{Vleuten: DC most significant scan= Fig1: P1. scan=Fig1: P1 to P4.

discrete cosine transformation=50,70,92 DCT.

attribute… active or inactive=col3 line62, col4 lines 10&19, "indication"

most significant scan=Fig1 P1. least significant scan=Fig1 P4. encode=Fig5 LLC.

}

1.(currently amended): A method of compressing image data into a fixed size memory, the image data being encoded using a discrete cosine transformation (50) and arranged into a plurality of scans of bitstream data, the plurality of scans being ordered from a perceptually most significant scan (Fig1 P1) to a perceptually least significant scan, (Fig1 P4) the method comprising the steps of:

determining whether the scans are a DC most significant scan or not; (Fig1 P1)

determining whether the scans are active or inactive based on an attribute (col3 line62, col4 lines 10&19, "indication") associated with each of the scans, the attribute being separate from the scan and identifying whether the scan is either active or inactive,

wherein the active scan is to be encoded (Col4 line45, Fig1, DCT_4 scans P1 to P3)

and the inactive scan is not to be encoded; (Col4 line45, Fig1, DCT_4 scan P4)

encoding, (Fig5: 54 LLC) if the scans are a DC most significant scan, the determined active scans of bitstream data encoded using the discrete cosine transformation and

discarding (Fig5: 53 Q) the determined inactive scans without encoding the inactive scans; (53 before 54)

transferring the encoded (54,76 LLC) scan bitstream data to the fixed size memory; (55,78,100) and setting, if the fixed size memory becomes full, the attribute of a currently least significant scan of the active scans to inactive. (col6 line36 "size of the memory 55 can be guaranteed by the buffer/rate control mechanism of the encoder 5." In advance, scans are fit to memory.)

Andrew discloses as follows,

determining whether the scans are a DC most significant scan or not; (Fig7 DC band)

transferring the encoded (106) scan bitstream data to the fixed size memory; (110) ([0037] "106 for entropy encoding the transform coefficients produced by the DCT unit 104, a scan output manager 108 for managing the storing of the transform coefficients in the final output buffer 110 of fixed memory size.")

and setting, if the fixed size memory becomes full, the attribute (flag) of a currently least significant scan (insignificant) of the *active* scans to *inactive*.

([0066] "...if the scan output manager 108 determines 350 that the free block register 212 is zero the scan output manager 108 sets 352 the *active* flag entry in the memory management table 200 of the most perceptually insignificant of the *active* scan streams to *inactive*.")

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

() **Regarding Claim 2:**

(Currently Amended) A method according to claim 1, wherein the method further comprises the step of: deleting, (overwritten) if the fixed size memory becomes full, the encoded scan bit-stream data of the currently least significant scan. (Andrew's [0015]. "if it is determined the storage is full a coded least perceptually significant partition currently stored in said buffer is overwritten by data from a coded more perceptually significant partition." 358.)

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAX SHIKHMAN whose telephone number is (571)270-1669. The examiner can normally be reached on Monday-Friday 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAX SHIKHMAN
Examiner Art Unit 2624
8.3.2009

/VIKKRAM BALI/
Supervisory Patent Examiner, Art Unit 2624